CIVIL QUALITY CONSULTANTS & ENGINEERS

(Buildings Geo-Tech & Highway Materials Testing Laboratory)
An ISO 9001: 2008 Certified Company

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13.03.2018

Job No.: CQCE/BBMP/KTR/W.No.15/2017-18

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. K.T Ramesh,** Contractor, Bangalore.
Name of Work	Improvements and Re-Asphalting of Road from HKR Chowtri to Shiva Temple Road & 1st main Bhuvaneshwari nagara in Dasarahalli Ward No.15, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Macadam
Date of Testing	13.03.2018

Result : Flakiness Index = **11.85%**

Elongation Index = **12.95%**

Result : Combined Flakiness & Elongation index **24.80%**

Note:

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2. The results indicated above are based on the tests carried out on the samples received in the laboratory
3. Any Query regarding the report must be reported within 15 days from the date of testing.

For CIVIL QUALITY CONSULTANTS & ENGINEERS

Authorised Signatory

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ಟಿ.ದಾಸರಹಳ್ಳಿ ಉಪ-ವಿಭಾಗ
ದಾಗಲಗುಂಟೆ, ಬಿಬಿಎಂಪಿ
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Job No.: CQCE/BBMP/KTR/W.No.15/2017-18 14.03.2018

BITUMEN CONTENT AND GRADATION DETERMINATION OF Dense Graded BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

CLIENT	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
AGENCY	**Sri. K.T Ramesh,** Contractor, Bangalore.
NAME OF THE WORK	Improvements and Re-Asphalting of Road from HKR Chowtri to Shiva Temple Road & 1st main Bhuvaneshwari nagara in Dasarahalli Ward No.15, BBMP, Bangalore.
SAMPLE I/D	Sample Supplied by Agency
DATE OF TESTING	14.03.2018

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	482.5	483
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	17.5	17.00
7. Bitumen content in %	3.50	3.40
8. Average	3.45	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
26.5	0	0	0	100	100
19	36.2	7.50	7.50	92.50	90-100
13.2	155.8	32.29	39.79	60.21	56-88
4.75	162.8	33.74	73.53	26.47	16-36
2.36	49.5	10.26	83.79	16.21	4-19
0.3	46.1	9.55	93.35	6.65	2-10
0.075	8.9	1.84	95.19	4.81	0-8

SIEVE SIZE	Trail 2				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
26.5	0	0	0	100	100
19	29.5	5.90	5.90	94.10	90-100
13.2	142.5	28.50	34.40	65.60	56-88
4.75	190.6	38.12	72.52	27.48	16-36
2.36	77.8	15.56	88.08	11.92	4-19
0.3	20.6	4.12	92.20	7.80	2-10
0.075	8.9	1.78	93.98	6.02	0-8

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Ref No. CQCE/BBMP/KTR/W.No.15/2017-18

Aggregate Gradation Test

IS : 2386 Part I

16.03.2018

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. K.T Ramesh,** Contractor, Bangalore.
Name of the Work	Improvements and Re-Asphalting of Road from HKR Chowtri to Shiva Temple Road & 1st main Bhuvaneshwari nagara in Dasarahalli Ward No.15, BBMP, Bangalore.
Type of Mix	Bituminous Concrete
Date of Testing	16.03.2018

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	459	9.18	9.18	90.82	79 - 100	
9.5	510	10.20	19.38	80.62	70 - 88	
4.75	658	13.16	32.54	67.46	53 - 71	
2.36	589	11.78	44.32	55.68	42 - 58	
1.18	620	12.40	56.72	43.28	34 - 48	
0.600	458	9.16	65.88	34.12	26 - 38	
0.300	410	8.20	74.08	25.92	18 - 28	
0.150	595	11.90	85.98	14.02	12 - 20	
0.075	426	8.52	94.50	5.50	4 - 10	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	495	9.90	9.90	90.10	79 - 100	
9.5	528	10.56	20.46	79.54	70 - 88	
4.75	620	12.40	32.86	67.14	53 - 71	
2.36	585	11.70	44.56	55.44	42 - 58	
1.18	610	12.20	56.76	43.24	34 - 48	
0.600	485	9.70	66.46	33.54	26 - 38	
0.300	420	8.40	74.86	25.14	18 - 28	
0.150	539	10.78	85.64	14.36	12 - 20	
0.075	415	8.30	93.94	6.06	4 - 10	

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Job No.: CQCE/BBMP/KTR/W.No.15/2017-18 16.0

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. K.T Ramesh,** Contractor, Bangalore.
Name of the Work	Improvements and Re-Asphalting of Road from HKR Chowtri to Shiv Temple Road & 1st main Bhuvaneshwari nagara in Dasarahalli Ward N BBMP, Bangalore.
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	16.03.2018

Sl No.	Details	Trial No.		A
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	89	91	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	291	291	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	23.42	23.82	

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

Note:

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⇒ Any Query regarding the report must be reported within 15 days from the date of testin

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KRUP/KTR/W.No.15/2017-18

16.03.2018

Specific Gravity And Water Absorption Test
IS: 2386 Part III

	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
	Sri. K.T Ramesh, Contractor, Bangalore.
the Work	Improvements and Re-Asphalting of Road from HKR Chowtri to Shiva Temple Road & 1st main Bhuvaneshwari nagara in Dasarahalli Ward No.15, BBMP, Bangalore.
	Bituminous Concrete
Testing	16.03.2018

Details	Notation	Test Number			Mean Value
		Test 1	Test 2	Test 3	
Weight of aggregate suspended in water with the basket	W_1 g	2023	2025	2027	
Weight of basket suspended in water	W_2 g	753	753	753	
Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1270	1272	1274	
Weight of saturated surface dry aggregate in air	W_3 g	2017	2019	2021	
Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	747	747	747	
Weight of oven dried aggregate	W_4 g	2010	2011	2012	
Specific Gravity	$W_4/(W_3-W_S)$	2.691	2.692	2.693	2.692
Apparent Specific gravity	$W_4/(W_4-W_S)$	2.716	2.721	2.726	2.721
Water Absorption	$((W_3-W_4)*100)/W_4$	0.35%	0.40%	0.45%	0.40%

Note:

Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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Job No.: CQCE/BBMP/KTR/W.No.15/2017-18 17.03.2018

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

CLIENT	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
AGENCY	**Sri. K.T Ramesh,** Contractor, Bangalore.
NAME OF THE WORK	Improvements and Re-Asphalting of Road from HKR Chowtri to Shiva Temple Road & 1st main Bhuvaneshwari nagara in Dasarahalli Ward No.15, BBMP, Bangalore.
DATE OF TESTING	17.03.2018

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	469	470
3. Weight of Asphalt and Mineral matter Extracted, g	31	30
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	31	30
7. Bitumen content in %	6.20	6.00
8. Average	6.10	

GRADATION AFTER EXTRACTION

TABLE - 1

SIEVE SIZE	Percent Passing, %		JOBMIX
mm	Sample 1	Sample 2	Gradation
19	100.00	100.00	100
13.2	95.26	96.10	79-100
9.5	79.52	80.14	70-88
4.75	65.36	66.41	53-71
2.36	51.52	52.36	42-58
1.18	42.54	43.18	34-48
0.6	30.36	31.84	26-38
0.3	25.25	26.54	18-28
0.15	18.52	19.15	12-20
0.075	6.36	7.48	4-10

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